

## National Energy Technology Laboratory

P 440.1-9

DATE: 7/19/01

**TITLE:** NETL ASSESSMENT, INSPECTION, TESTING, AND MAINTENANCE OF FIRE PROTECTION SYSTEMS, EQUIPMENT, AND PROGRAMS

1. PURPOSE: To define the NETL requirements for assessing, inspecting, testing, and maintaining NETL's fire protection systems and equipment.
2. CANCELLATION: This Procedure replaces all documents created prior to the formation of NETL that pertain to Facility Fire Protection Evaluations and Inspection, Testing, and Maintenance of Primary Fire Systems and Equipment.
3. REFERENCES:
  - a. DOE Order 420.1, Facility Safety, of 11/22/00.
  - b. DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees, of 3/27/98.
  - c. DOE Guide 440.1-5, Implementation Guide for Fire Safety Program, of 9/30/95.
  - d. Statutory ES&H Standards:
    - (1) 29 CFR 1910, Subpart L, Fire Protection.
  - e. Reference ES&H Standards:
    - (1) NFPA 10, Portable Fire Extinguishers.
    - (2) NFPA 25, Water-Based Fire Protection Systems.
    - (3) NFPA 72, National Fire Alarm Code.
4. DEFINITIONS:
  - a. AHJ -- Authority Having Jurisdiction.
  - b. FHA -- Fire Hazard Analysis.

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**INITIATED BY:** Office of Business  
and Logistics

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- c. Fire Protection Equipment -- Fire hydrants, standpipes and associated hoses, control valves on piping that supply water for fire protection, sprinkler system water supplies, sprinkler heads, special types of protection (e.g., carbon dioxide, liquid suppression systems), portable fire extinguishers, smoke and heat detectors, alarm and communication systems, and emergency exit lighting.
- d. Fire Protection System -- An integrated system of fire protection equipment designed to automatically supply water or another extinguishing agent in the event of a fire and concurrently activate an alarm system.
- e. FPPM -- Fire Protection Program Manager. The designated DOE Fire Protection Specialist who has the day-to-day authority and responsibility to administer NETL's Fire Protection Program.
- f. Inspection -- A visual check of fire protection systems and equipment to ensure that they are in place, charged, and ready for use in the event of a fire.
- g. NFPA Codes -- National Fire Protection Association codes that are required by DOE policy.
- h. SSC -- Site Support Contractor (Site Operations). The on-site organization under contract to NETL that provides site operations support services.
- i. Testing/Maintenance -- The performance of services on fire protection systems and equipment to ensure that they will operate as expected in the event of a fire. This includes periodic physical checks on fire protection systems and equipment.

5. QUALITY CONTROL:

- a. Documentation evidencing compliance with this Procedure shall be checked by the FPPM during the biannual NETL site-wide Fire Protection Program Assessment.
- b. The FPPM shall review this Procedure periodically (but at least annually) and recommend revisions as necessary to cover changing conditions or regulatory requirements. The FPPM shall incorporate lessons learned based on feedback received from NETL DOE and contractor employees and visitors

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in accordance with NETL Procedures, Lessons Learned and  
Feedback, and Continuous Improvement.

6. RESPONSIBILITIES:

a. The FPPM shall:

- (1) Establish and maintain a list of buildings subject to facility fire protection self-appraisals and the frequency of appraisal required.
- (2) Take all reasonable actions to ensure evaluations described in this Procedure are performed.
- (3) Perform fire protection program reviews.

b. The SSC ES&H shall:

- (1) Execute the requirements in the Standard Operating Procedures in Attachment 1, List of Standard Operating Implementing Procedures for Inspecting, Testing, and Maintaining of Primary Fire Systems.
- (2) Ensure that fire protection equipment and system maintenance issues are resolved or referred to the FPPM for resolution.
- (3) Submit any proposed revisions to the Fire Protection Standard Operating Procedures (SOPs) to the FPPM for approval.
- (4) Provide annual training for Security personnel on the operation of the Fire Protection Alarm System.

c. Line Managers and Employees shall:

- (1) Provide assistance as required to support the inspection, testing, and maintenance of site fire protection systems.
- (2) Implement corrective actions as necessary to address fire protection deficiencies identified during various fire protection program reviews.
- (3) Immediately notify the FPPM of any fire protection problems or concerns that may impact overall site operations.

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- (4) Participate on ES&H Management Walkthrough Inspections and SARS reviews of facilities, support operations, or R&D projects.

7. TRAINING REQUIREMENTS:

- a. The SSC ES&H shall ensure that the people who perform the fire protection inspection, testing, and maintenance activities at NETL possess the required level of knowledge (e.g., based on education and experience in implementing NFPA and OSHA fire protection guidelines and standards) to competently perform those activities.
- b. NETL Security shall receive annual training on operating the Fire Protection Alarm System.

8. DOCUMENT CONTROL:

- a. Inspection, testing, and maintenance activities conducted on fire protection systems and equipment shall be formally documented, and shall include the individual's name, date of inspection, test or maintenance activity, identification and location of equipment, and notation of any discrepancies identified and/or corrected.
- b. The SSC ES&H shall route NETL fire protection system and equipment inspection, testing, and maintenance records to the ES&H Records Center for retention in accordance with applicable DOE record retention requirements.
- c. The documents contained in Attachment 1, List of NETL Standard Operating Implementing Procedures for Inspecting, Testing, and Maintaining Primary Fire Systems, may be revised independently as a modification to this Procedure upon the recommendation of the SSC ES&H and subject to FPPM approval.
- d. The forms contained in Attachment 2, List of NETL Fire Protection Inspection, Testing, and Maintenance Forms, may be revised independently as a modification to this Procedure upon the recommendation of the SSC ES&H and subject to FPPM approval.
- e. Updated FHAs and Life Safety Code Studies shall be sent to the AHJ by the FPPM for review. Following their review, the FPPM shall route copies of the evaluation reports and studies to ES&H Central Records.

9. PROCEDURE:

- a. Standard Operating Implementing Procedures -- Inspecting, testing, and maintaining fire protection systems and equipment shall follow the implementing procedures set forth in Attachment 1, List of NETL Standard Operating Implementing Procedures for Inspecting, Testing, and Maintaining Primary Fire Systems.
- b. Forms -- The person performing the inspection, test, or maintenance activities shall use the inspection forms in Attachment 2, List of NETL Fire Protection Inspection, Testing, and Maintenance forms.
- c. Fire Protection System Impairment
  - (1) If a fire protection system's ability to perform correctly in a fire emergency is impaired, the FPPM shall be notified, and immediate action shall be taken to correct the problem and to ensure the safety of people and equipment in the facility while the problem is being corrected. The requirements described in NETL Procedure 440.1-11, NETL Fire Protection Impairment, shall also be followed.
  - (2) All fire protection system problems that are discovered shall be corrected according to NFPA code requirements and manufacturer's instructions (if applicable).
  - (3) Any extinguishing system component or piece of equipment that can be recharged shall be recharged after use.
- d. Program and Facility Fire Protection Assessments -- NETL fire protection evaluations fall into two main categories: program assessments and facility fire protection assessments. A program assessment occurs every 2 years and focuses on a review of the documents that define, guide, and record the Fire Protection Program at NETL. The facility fire protection assessment occurs every 3 years and focuses on physical fire protection aspects of the facilities.
  - (1) Program Assessments. An assessment of NETL's Fire Protection Program shall be performed once every "even"-numbered year and may be performed any time

during the year. The Fire Protection Program Assessment performed by the FPPM shall:

- (a) Review all Fire Protection Program procedures, handbooks, and plans. Below is a list of major items to check (not all inclusive):
    - Ensure that all fire protection procedures and handbooks are listed in the Fire Protection Plan.
    - Spot-check procedure compliance. Discuss compliance with the responsible parties.
    - Check documents against the latest DOE Orders, NFPA codes, and other applicable documents.
    - Check procedures for clarity, current terminology, position titles, etc.
    - Ensure all fire protection documents are well coordinated, especially with the Fire Protection Plan.
    - Make changes to any of the fire protection procedures that are beneficial.
  - (b) Review all fire protection-related procedures, standard operating implementing procedures, and plans for the following:
    - Coordination with the Fire Protection Program.
    - Inclusion in the Fire Protection Plan list.
    - Compliance with the latest DOE, NFPA, etc., requirements.
  - (c) Review pre-fire plans. Obtain local fire department input before making major format changes.
- (2) Facility Fire Protection Assessments. Facility fire protection assessments shall be performed on each NETL facility. The FPPM is responsible for

maintaining a list of facilities, that require appraisals for the next 3 years. The fire protection assessment consists of two parts: a facility fire protection inspection and a procedure and documentation review that will be performed by the FPPM or designee.

- (a) Facility Fire Protection Inspection. The fire protection inspection is a physical inspection of the facility for all aspects of fire protection and life safety. These shall include, but are not limited to:
  - An inspection of the facility, comparing the most current FHA and Life Safety Code Study information against the physical evidence in the facility.
  - An inspection of the facility, comparing the most current versions of all applicable NFPA codes and DOE Orders. Each of the topics listed in NETL's Fire Protection Plan, under the Facility Fire Protection Appraisals section, shall be explicitly reviewed and the results documented by the FPPM.
  - The FHA and Life Safety Code Study shall be updated and revised as necessary.
- (b) Procedure and Documentation Review. The procedure and documentation audit shall include all of the items shown in the Facility Fire Protection Assessment section of NETL's Fire Protection Plan that must be done by the FPPM.

e. Corrective Actions -- The FPPM shall analyze and verify findings of non-compliance from any assessment, inspection, audit, etc., and develop a list of maintenance or corrective action items based on his/her analysis.

- (1) Each new action item list will supersede all previous lists for the facility and will include any unresolved action items from past lists unless the old items have been resolved to the satisfaction of the FPPM.

- (2) The items shall be placed in order of importance based first, on life safety; and second, on possible economic impact, according to the judgment of the FPPM.
- (3) Each maintenance or corrective action item shall be documented to include a full description of the item including a cost estimate and status description.

f. Fire Inspections and Surveys

- (1) Safety analysis reviews of the NETL facilities and projects shall be conducted to review fire protection systems and equipment. The objectives shall be to:
  - (a) Assure that the hazard to life and property from fire, explosion, or related risk has been evaluated and reduced to acceptable levels.
  - (b) Evaluate the adequacy of the local fire protection and prevention programs to minimize injury and protect DOE property.
  - (c) Provide written reports to responsible management, that will include recommendations for appropriate action.
- (2) Annual fire protection appraisal reviews shall be conducted by the NETL SSC ES&H. The reviews are to be made to verify compliance and effectiveness to the following:
  - (a) Appropriate actions have been taken to comply with previous fire protection survey recommendations.
  - (b) The fire protection activities described in the NETL Fire Safety Program are being conducted.
  - (c) Losses, impairments, and unusual incidents are investigated and analyzed in sufficient depth to identify causes, economical and effective corrective methods, and areas where similar problems may exist.



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(d) The NETL facilities are being reviewed on a semi-annual basis with local off-site fire department personnel.

(3) ES&H management walkthrough inspections conducted by NETL staff on a monthly schedule shall include fire protection activity/equipment reviews.

g. Fire Equipment Inspection, Testing, and Maintenance

(1) An inspection schedule has been developed to assure fire protection equipment is inspected, maintained, and tested in accordance with applicable requirements. Inspection and testing frequency shall be in accordance with NFPA requirements.

(2) Emergency maintenance and repairs of fire protection systems and equipment shall be coordinated by the FPPM with the NETL Site Operations Division.

10. ATTACHMENTS:

- a. Attachment 1 -- List of Standard Operating Implementing Procedures for Inspecting, Testing, and Maintaining Primary Fire Systems and Equipment.
- b. Attachment 2 -- List of NETL Fire Protection Inspection, Testing, and Maintenance Forms.

Approved: \_\_\_\_\_  
OBL Associate Director

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NETL Directives Coordinator

LIST OF STANDARD OPERATING IMPLEMENTING PROCEDURES  
FOR INSPECTING, TESTING, AND MAINTAINING  
PRIMARY FIRE SYSTEMS AND EQUIPMENT

1. Portable Fire Extinguishers
2. Wet Pipe Sprinkler Systems
3. Dry Pipe/Preaction Sprinkler Systems
4. Deluge Sprinkler System
5. Standpipe Systems
6. Dry Standpipe System
7. Fire Hydrant and Fire Service Mains
8. Fire Alarm and Detection System
9. Range Hood Systems
10. Emergency Exit Lighting
11. Fire Protection System Winterization

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LIST OF NETL FIRE PROTECTION INSPECTION,  
TESTING, AND MAINTENANCE FORMS

1. Fire Extinguisher Checklist
2. Wet Pipe Sprinkler Systems Monthly Inspection
3. Wet Pipe Sprinkler Systems Annual Inspection
4. Wet Pipe Sprinkler Systems Five-Year Inspection
5. Wet Pipe Sprinkler Systems Quarterly Test
6. Wet Pipe Sprinkler Systems Annual Test
7. Wet Pipe Sprinkler Systems Five-Year Test
8. Wet Pipe Sprinkler Systems Annual Maintenance
9. Dry Standpipe Sprinkler Systems Monthly Inspection
10. Dry Standpipe Sprinkler Systems Five-Year Inspection
11. Dry Standpipe Sprinkler Systems Quarterly Test
12. Dry Standpipe Sprinkler Systems Annual Test
13. Dry Standpipe Sprinkler Systems Five-Year Test
14. Dry Standpipe Sprinkler Systems Annual Maintenance
15. Dry Standpipe Sprinkler Systems Five-Year Maintenance
16. Dry Pipe/Preaction Sprinkler Systems Weekly Inspection
17. Dry Pipe/Preaction Sprinkler Systems Three-Year Test
18. Fire Hydrant and Fire Service Mains Monthly Inspection
19. Post Indicator Valves Monthly Inspection
20. Fire Hydrant and Fire Service Mains Semi-Annual Inspection
21. Post Indicator Valves Quarterly Test

22. Fire Hydrant and Fire Service Mains Annual/Five-Year Test and Maintenance
23. Fire Detector and Alarm System Monthly Inspection, Test, and Maintenance
24. Fire Detector and Alarm System Quarterly Test and Maintenance
25. Fire Detector and Alarm System Semi-Annual Inspection, Test, and Maintenance
26. Fire Detector and Alarm System Annual Inspection
27. Range Hood System 12-Year Test
28. Range Hood System Monthly Inspection
29. Range Hood System Semi-Annual Inspection
30. Range Hood System Semi-Annual Maintenance

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